

## Chapter 2

### Planning: Integrating Environmental Considerations

*“The American people will continue to expect us to win in any engagement, but they will also expect us to be more efficient in protecting lives and resources while accomplishing the mission successfully. Commanders will be expected to reduce the costs and adverse effects of military operations, from environmental disruption in training to collateral damage in combat.”*

Joint Vision 2010

The integration of environmental considerations into planning is very similar to the integration of safety and force protection issues. Whether using the MDMP, or building a training plan, the requirement to integrate environmental considerations into the planning process is critical. This chapter discusses environmental planning and focuses on how and where the Army integrates environmental considerations into the MDMP, as specified in FM 101-5. While this process is Army specific, it is similar to the process employed by the USMC. Each day leaders make decisions affecting the environment. These decisions effect natural and cultural resources entrusted to the Army and the USMC. These decisions also have serious environmental and legal consequences for decision-makers. The military's inherent responsibility to the nation is to protect and preserve its environmental resources—a responsibility that resides at all levels. Risk management is an effective process to assist in preserving these resources. Unit leaders identify actions that may negatively impact the environment and take appropriate steps to prevent or mitigate damage. This chapter illustrates how to use the risk management process to assess and manage environmental-related risk during planning, training, and operations.

### THE MILITARY DECISION-MAKING PROCESS

2-1. The MDMP (see Figure 2-1, page 2-2) is defined in FM 101-5. It relies on doctrine, especially the terms and symbols (graphics) found in *Operational Terms and Graphics*. The MDMP helps the commander and his staff examine the battlespace and reach logical decisions. The process helps them apply thoroughness, focus, sound judgment, logic, and professional knowledge to reach a decision. From start to finish, the commander's personal role is central. His participation in the process provides focus and guidance to the staff. The commander uses the entire staff during the MDMP to explore the full range of probable and likely enemy and friendly courses of action (COAs), and analyze and compare his own organization's capabilities

with the enemy's. This staff effort has one objective—to integrate information collectively with sound doctrine and technical competence to assist the commander in his decisions, ultimately leading to effective plans. The selected COA and its implementing OPORD are directly linked to how well both the commander and staff accomplish each phase of the MDMP.

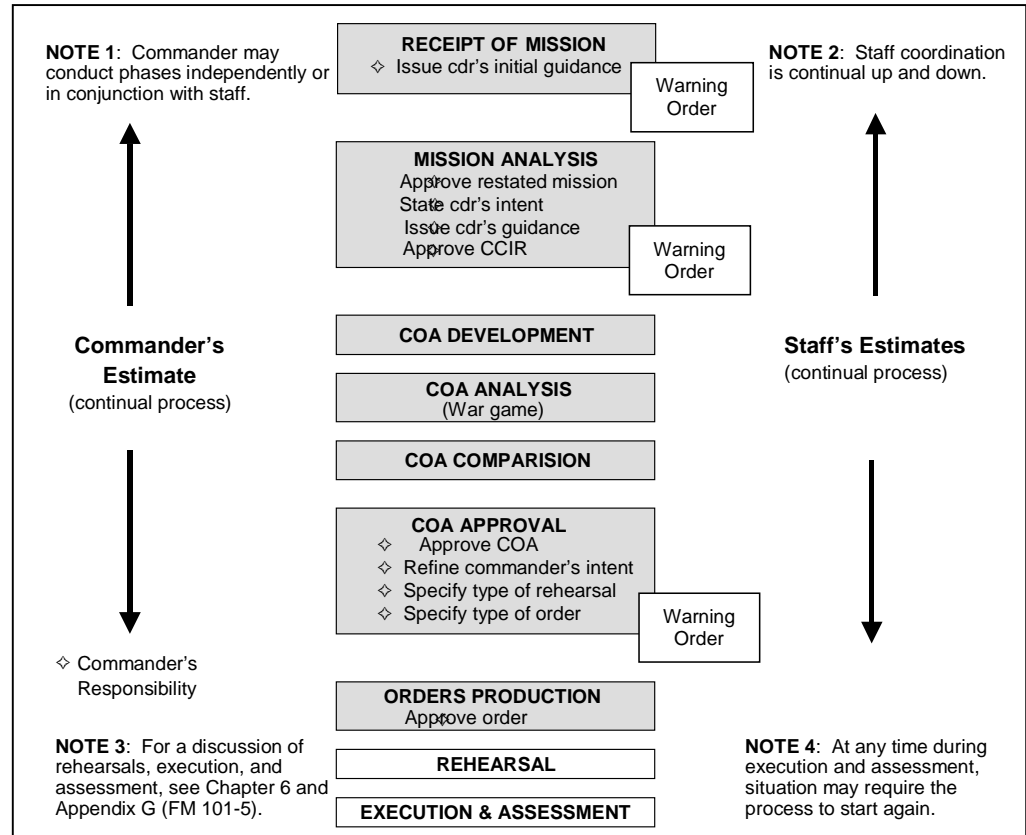


Figure 2-1. The MDMP

2-2. This manual does not attempt to teach this process, but rather uses the framework provided in FM 101-5 to discuss the application of environmental considerations throughout the MDMP and highlight the critical steps for environmental input. Environmental considerations are generally addressed as functions of risk, much like the application of safety considerations. Risk is expected. As with all other types of risk, leaders can effectively minimize environmental-related risk while optimizing the unit's capacity to remain responsive and agile. When the command and control (C<sup>2</sup>) system places timely, comprehensive, quality information in front of the decision-maker, leaders are able to mitigate risk and maximize performance. The MDMP model contains seven steps (see Figure 2-2, page 2-3), each of which incorporate environmental considerations.

- |         |                     |
|---------|---------------------|
| Step 1. | Receipt of Mission. |
| Step 2. | Mission Analysis.   |
| Step 3. | COA Development.    |
| Step 4. | COA Analysis.       |
| Step 5. | COA Comparison.     |
| Step 6. | COA Approval.       |
| Step 7. | Orders Production.  |

**Figure 2-2. Steps in the MDMP**

## **RECEIPT OF MISSION**

2-3. Receipt of mission focuses on the **proactive** requirements for environmental consideration. To be successful, input regarding environmental considerations must be both early and integrated. It must also be presented in a format (unit of measure) that is readily useful to the commander and one that allows him to formulate his initial guidance and his intent rapidly. The preparation for mission analysis focuses on gathering the necessary tools for the analysis. These tools include:

- The environmental appendix or annex from the higher headquarters' order or plan (see Appendix B). The commander can also find environmental guidance in the coordinating instructions of paragraph 3, the service support annex, or in guidance from the surgeon or other special staff officers.
- Maps of the area to help the commander assess likely areas for significant environmental consideration.
- The commander's or higher headquarters' SOPs (see Appendix C).
- Appropriate documents and references (such as this field manual), applicable HN agreements, DOD overseas environmental baseline guidance document (OEBGD), or similar instructions or guidance.
- Any existing staff estimates as well as applicable lessons learned or AAR materials. The commander should not be content with simply seeking out the higher headquarters' staff estimate.

2-4. All staff officers should develop a generic list of environmental considerations and associated requirements in their respective area(s) to add to the general guidelines given in FM 101-5, Appendix A. Staff inputs and outputs during the MDMP are highlighted in Figure 2-3, page 2-4.

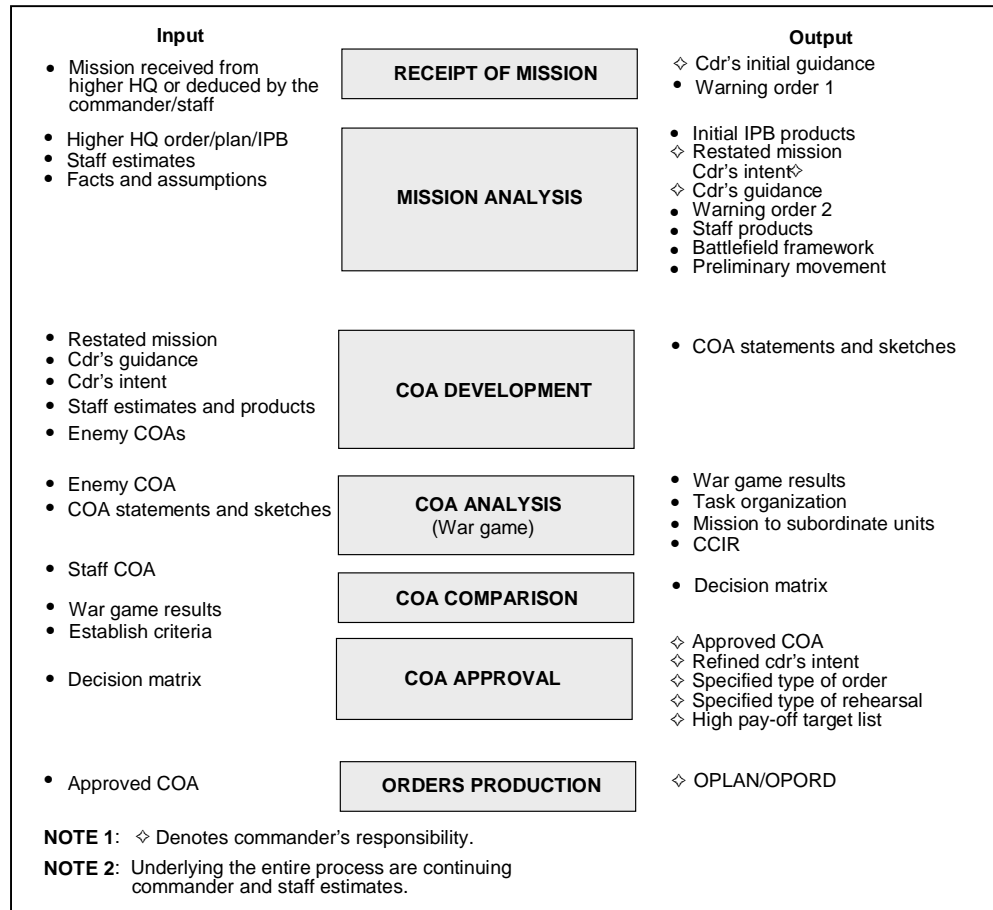


Figure 2-3. Staff inputs and outputs

## MISSION ANALYSIS

2-5. Mission analysis has 17 subordinate steps. While this process results in the staff formally briefing the commander, there may be items of such importance to the commander and the formulation of his commander's guidance that they need to be brought to the commander immediately rather than waiting until the formal briefing. If a staff officer has developed good tools to facilitate mission analysis, he dramatically increase his ability to be effective.

2-6. The 17 subordinate steps of mission analysis provide the framework for success in the MDMP. It is essential to perform effective work at this point in the process. Some steps will prove to be more vital than others in the application of environmental considerations. The steps in mission analysis are included in Figure 2-4, page 2-5.

- |          |   |
|----------|---|
| Step 1.  | Analyze the higher headquarters' order.                                 |
| Step 2.  | Conduct initial IPB.  |
| Step 3.  | Determine specified, implied, and essential tasks.                      |
| Step 4.  | Review available assets.  |
| Step 5.  | Determine constraints.  |
| Step 6.  | Identify critical facts and assumptions.                                |
| Step 7.  | Conduct risk assessment.  |
| Step 8.  | Determine initial commander's critical information requirements (CCIR). |
| Step 9.  | Determine the initial reconnaissance annex.                             |
| Step 10. | Plan use of available time.   |
| Step 11. | Write the restated mission.   |
| Step 12. | Conduct a mission analysis briefing.                                    |
| Step 13. | Approve the restated mission.   |
| Step 14. | Develop the initial commander's intent.                                 |
| Step 15. | Issue the commander's guidance.   |
| Step 16. | Issue a warning order (W0).   |
| Step 17. | Review facts and assumptions.   |

**Figure 2-4. Steps in the mission analysis**

### **Step 1. Analyze the Higher Headquarters' Order**

2-7. The commander and his staff thoroughly analyze the higher headquarters' order and identify guidance on environmental consideration. The level of the CINC is the logical echelon for civil-military interface, and is the echelon that typically initiates military environmental guidance. If confused by the higher headquarters' order or guidance, the staff **must immediately seek clarification**. While there is generally a specific annex or appendix on environmental considerations in the higher headquarters' order, it is not the only source of guidance. Coordinating instructions or guidance from the G4 and others may also contain information critical to environmental considerations.

### **Step 2. Conduct Initial IPB**

2-8. The IPB is a systematic, continuous process of analyzing the threat and the effects of the environment on the unit. It identifies facts and assumptions that determine likely threat COAs. The IPB supports the commander and staff and is essential to developing estimates and performing decision-making. It is a dynamic, commander driven, staff process, that continually integrates new information.

2-9. The IPB is the commander's and each staff officer's responsibility; the G2 does not conduct the entire IPB himself. Staff officers must assist the G2 in developing the situation template (SITTEMP) within their own areas of expertise. Environmental considerations may make it prudent to focus some of the IPB support to assist in site selection for units moving into an operational area. Environmentally sensitive areas are defined in FM 101-5-1 as environmental areas of interest. Environmental areas of interest include natural and manmade structures such as waste treatment plants and dams.

### **Step 3. Determine Specified, Implied, and Essential Tasks**

2-10. The staff analyzes higher headquarters' orders to determine which environmental considerations should be specified, implied, and essential tasks. The mission determines if environmental considerations are essential tasks. If, for example, the mission is focused on response to a natural or manmade emergency, it is more likely that environmental considerations will be important.

### **Step 4. Review Available Assets**

2-11. The commander and staff examine additions to and deletions from the current task organization, support relationships, and status (current capabilities and limitations) of all units. They consider the relationship between specified and implied tasks and available assets. From this information, they determine whether they have the assets to perform all specified and implied tasks. If there are shortages, they identify additional resources needed for mission success. The staff pays particular attention to deviations from what the commander considers to be his normal task organization. Subordinate unit current capabilities and limitations to deal with environmental considerations may be limited. If environmental considerations require expertise that is not organic to the commander's unit or his subordinate units, it is critical that those issues are raised. As an example, a unit may require specialized assistance (to include corps real estate support teams [CREST], environmental law expertise, and engineer command [ENCOM] support) to perform effective EBSs of support locations or areas within the deployment location itself.

### **Step 5. Determine Constraints**

2-12. A higher commander normally places some constraints on his subordinate commanders that restrict their freedom of action. Environmental considerations may also cause constraints on an operation. The commander and his staff must identify and understand these constraints. These will normally be found in the scheme of maneuver, concept of operations, and the coordinating instructions. The commander ensures that critical environmental constraints are up front in the body of the order and not merely relegated to an annex or appendix.

### **Step 6. Identify Critical Facts and Assumptions**

2-13. The staff gathers two categories of information concerning assigned tasks: facts and assumptions. Facts are statements of known data concerning the situation, including enemy and friendly dispositions, available troops, unit strengths, and material readiness. Assumptions are suppositions about the current or future situation that are assumed to be true in the absence of facts. They take the place of necessary, but unavailable, facts and fill the gaps in what the commander and staff know about a situation. An assumption is appropriate if it meets the tests of validity and necessity. Validity means the assumption is likely to be true. "Assuming away" potential problems, such as weather, environmental considerations, or likely enemy options, would result in an invalid assumption. Necessity is whether or not the assumption is

essential for planning. If planning can continue without the assumption, it is not necessary and should be discarded. When possible, assumptions are cleared with the higher HQs to ensure they are consistent with the higher headquarters' plan. Assumptions are replaced with facts as soon as possible.

2-14. The mission may require significant environmental considerations. In this case, the facts and assumptions regarding environmental considerations may assume a preeminent position in the planning process.

#### **Step 7. Conduct Risk Assessment**

2-15. The commander and his staff identify accident risk hazards and make an initial assessment of the risk level for each hazard. The commander also makes an initial assessment of where he might take tactical risk. (See the risk section of this chapter and FM 101-5, Annex J.) While the focus of risk assessment is on tactical risk, significant issues for accident risk, with respect to the environment, are also considered.

#### **Step 8. Determine Initial Commander's Critical Information Requirements (CCIR)**

2-16. The CCIR identify information that the commander needs to support his battlespace visualization and to make critical decisions, especially to determine or validate courses of action. They help the commander filter information by defining what is important to mission accomplishment. They also focus the efforts of subordinates in the allocation of resources, and assist staff officers in making recommendations. Environmental considerations that may be part of the CCIR include protection of cultural/historical sites, water sources, HW/polluted industrial sites, or other significant safety considerations. The commander alone decides critical information based on his experience, the mission, the higher commander's intent, and input from the staff.

2-17. The CCIR directly effect the success or failure of the mission and are time sensitive, driving decisions at decision points.

#### **Step 9. Determine the Initial Reconnaissance Annex**

2-18. Based on the IPB and CCIR, the staff, primarily the G2, identifies gaps in the intelligence and develops an initial reconnaissance and surveillance plan to acquire information based on available reconnaissance assets. The G3/S3 turns this reconnaissance plan into an initial reconnaissance annex to launch reconnaissance assets as soon as possible to begin the collection effort.

2-19. This may include acquiring the support of outside agencies and higher headquarters. Special requests for environmental information on environmental considerations critical to the operation are included in the initial IPB and CCIR. Environmental reconnaissance, as defined in FM 101-5-1, includes "the systematic observation and recording of site or area data collected by visual or physical means, dealing specifically with environmental conditions as they exist, and identifying areas that are environmentally sensitive or of relative environmental concern, for information and decision-making purposes." Reconnaissance of sites that may become base camps, deployment sites, marshalling areas, logistical sites, or other critical areas with significant environmental considerations may be included.

**Step 10. Plan Use of Available Time**

2-20. The commander and his staff refine their initial plan for the use of available time. They compare the time needed to accomplish essential tasks to the higher headquarters' timeline to ensure mission accomplishment in the allotted time. Whether or not time is available to conduct an EBS of the area(s) of deployment or support for an operation is of critical importance during this step.

**Step 11. Write the Restated Mission**

2-21. The CofS/XO or G3/S3 prepares a restated mission for the unit based on the mission analysis. The restated mission includes on-order missions; be-prepared missions are in the concept of operations. Environmental considerations may be addressed in the restated mission, especially if the unit mission is to respond to a forest fire, flood, or some other natural or man-made disaster.

**Step 12. Conduct a Mission Analysis Briefing**

2-22. Time permitting, the staff briefs the commander on its mission analysis. This briefing is often the only time the entire staff is present and the only time to ensure that all staff members are starting from a common reference point. The relevant conclusions about environmental considerations, drawn from the mission analysis, help the commander and staff develop a shared vision of the requirements for the upcoming operation.

**Step 13. Approve the Restated Mission**

2-23. Immediately after the mission analysis briefing, the commander approves a restated mission. This mission can be the staff's recommended restated mission, a modified version of the staff's recommendation, or one that the commander has developed. Once approved, the restated mission becomes the unit's mission. If environmental considerations are crucial to the mission, they may become a part of the restated mission.

**Step 14. Develop the Initial Commander's Intent**

2-24. The commander's intent is a clear, concise statement of what the force must do to succeed with respect to the enemy and terrain and to achieve the desired end state. It provides the link between the mission and the concept of the operation by stating the key tasks that, along with the mission, are the basis for subordinates to exercise initiative when unanticipated opportunities arise or when the original concept of operations no longer applies. If the commander wishes to explain a broader purpose beyond that of the mission statement, he may do so. The commander's intent may contain guidance on environmental considerations especially when mission success hinges on socio-economic, political, cultural, or similar goals that effect the end state.



**Step 15. Issue the Commander's Guidance**

2-25. After the commander approves the restated mission and states his intent, he provides the staff with enough additional guidance (preliminary decisions) to focus staff activities while planning the operation. This guidance is essential for timely COA development and analysis. By stating his intent and the planning options he wants them to consider, he can save staff members' time and effort by allowing them to concentrate on developing COAs that meet his intent. His guidance may be written or oral and is perhaps the most likely location for guidance to be given on environmental considerations, especially when involved in combat operations. In the case of combat operations, most environmental considerations will take a relative back seat to other considerations, as greater environmental risk is likely to be taken.

**Step 16. Issue a Warning Order (WO)**

2-26. Immediately after the commander provides his guidance, the staff sends subordinate and supporting units a WO. The staff ensures that risk guidance includes pertinent environmental considerations.

**Step 17. Review Facts and Assumptions**

2-27. Ideally, initial mission analysis will identify and quantify most of the likely environmental considerations. During the rest of the decision-making process, the commander and staff periodically review available facts and assumptions. New facts may alter requirements and analysis of the mission. Assumptions may have become facts or may have become invalid. Whenever the facts or assumptions change, the commander and staff assess the impact of these changes on the plan and make the necessary adjustments. The discovery of additional environmental considerations are likely as the planning progresses and reconnaissance information is forthcoming.

**COA DEVELOPMENT**

2-28. After receiving guidance, the staff develops COAs for analysis and comparison. The commander must involve the entire staff in COA development. His guidance and intent focus the staff's creativity to produce a comprehensive, flexible plan within time constraints. During COA development, the commander and staff continue the risk management process (see the risk discussion in this chapter and FM 101-5, Appendix J).

2-29. Environmental considerations will usually be most prominent in meeting the criteria of suitability and acceptability. The staff develops the COAs to accomplish the mission and meet the commander's guidance with respect to environmental considerations. Provided that the staff has informed the commander about significant environmental considerations, the commander will have incorporated these into his initial guidance.

**COA ANALYSIS**

2-30. The war game helps the commander and his staff to focus on each stage of the operation in a logical sequence. Every staff member must determine the force requirements for external support, risks, and each COA's strengths and weaknesses. Determining evaluation criteria (step 5) is probably the most important step of war gaming for environmental considerations. If environmental considerations are prominent enough, they are included in the commander's guidance and intent, as well as the specified criteria for the level of residual risk for accident hazards in the COA. Step 5 is where criteria are assigned for the COA comparison. War gaming the battle and assessing the results (step 8) is also important in the evaluation of environmental considerations. It is a requirement for staff officers to conduct risk management for each COA. Every COA must clearly identify the level of risk that the commander is willing to accept to include those associated with environmental considerations.

**COA COMPARISON**

2-31. Environmental considerations will normally be included in the general criterion of "residual risk," or if significant enough, may even be a separate criterion. Remember that criteria are assigned in step 5 of the war gaming process. If any environmental consideration was important enough to be in the commander's guidance or intent, it will be listed here as well.

**COMMANDER'S DECISION BRIEFING**

2-32. After completing its analysis and comparison, the staff identifies its preferred COA and makes a recommendation. If the staff cannot reach a decision, the CofS (XO) decides which COA to recommend at the commander's decision briefing. The staff then briefs the commander. Critical environmental considerations have become one of the criteria in the decision matrix.

**COA APPROVAL**

2-33. Again, critical environmental considerations listed in the commander's guidance or intent, will be a factor in the commander's approval of a particular COA.

**ORDERS PRODUCTION**

2-34. Environmental concerns are addressed by every staff officer, as applicable, in respective annexes and appendixes. In the context of an order following the format in FM 101-5, the specified appendix is Appendix 2 to Annex F (Engineer). The specified annex to address environmental considerations for a Joint Operation Planning and Execution System (JOPES) format is Annex L. The ENCOORD, functioning in this role for the G3 (or potentially the G4) has the integrating responsibility for this appendix or annex in the same general fashion that the G2 is responsible for the integration of IPB. An example appendix is found in Appendix B of this manual.

## ENVIRONMENTAL-SPECIFIC PLANNING

2-35. Environmental-specific planning focuses on providing units with the additional environmental related resources and information necessary to accomplish their missions. Operational and support planning also includes environmental protection objectives. In operational situations (discussed in depth in Chapter 4), whether for training, contingency operations, or combat, environmental planning focuses on the mission requirements of a military unit. This planning includes identifying environmental risks posed by an operation and considering ways to reduce those risks during long-, short-, and near-term planning. Units require facilities, training areas, and support systems that must be managed to secure long-term availability. Environmental support planning is, by nature, long-term. The elements of environmental planning are included in Figure 2-5. Additional considerations must include medical waste and unexploded ordnance.

<b>Joint Doctrine for Civil Engineering Support Joint Publication 4-04</b>	
<ul style="list-style-type: none"><li>• Policies and responsibilities to protect and preserve the environment during the deployment.</li><li>• Certification of local water sources by appropriate medical field units.</li><li>• Solid and liquid management:<ul style="list-style-type: none"><li>- Open dumping.</li><li>- Open burning.</li><li>- Disposal of gray water.</li><li>- Disposal of pesticides.</li><li>- Disposal of human waste.</li><li>- Disposal of HW.</li></ul></li><li>• HM management, including the potential use of pesticides.</li><li>• Flora and fauna protection.</li><li>• Archaeological and historical preservation.</li><li>• Base field spill plan.</li></ul>	

**Figure 2-5. Elements of environmental-specific planning**

## OPERATIONAL PLANNING

2-36. Operational planning usually begins with a formal staff estimate as a part of the MDMP. However, operational planning may entail a separate study on the characteristics of the AO or an informal review of the environmental considerations and issues contained in the higher headquarters' OPLAN or OPORD. In either situation, operational planning provides unit leaders with information they require for unit planning. If your operation will require the use of base camps, it is critical to begin the planning for them at this point.

2-37. Operational or tactical Army or Marine Corps units may operate in the theater or as part of a joint task force and be required to interface with the actions of a temporary board that the joint commander or his designated commander, joint task force (CJTF) may activate. This is called the joint environmental management board (JEMB). See Appendix D for more information on the JEMB.

## **STAFF PLANNING**

2-38. Staffs conduct environmental planning within the context of the mission. Their efforts produce information that helps units understand the mission's environmental requirements. Most often, staffs develop this information in the form of staff estimates, environmental protection levels, and an EBS.

### **Staff Estimates**

2-39. Each staff officer incorporates environmental considerations into his staff estimate (Paragraph 2 – Staff Estimate Format). The staff estimate may include the following:

- Significant environmental weaknesses and sensitivities in the AO.
- Potential enemy environmental targets.
- Critical or unique resources to the area.
- Environmental conditions related to the situation.
- Applicable laws and regulations.

2-40. Staffs identify environmental weaknesses and critical terrain that may be a factor to be avoided, actively protected, or exploited temporarily to accomplish the mission. They identify potential enemy environmental targets and plan contingency responses. The following environmental factors normally require consideration during staff estimates:

- Topography and soils.
- Vegetation, including crops.
- Air quality.
- Wildlife and livestock.
- Archaeological and historical sites.
- Safety and public health.
- Land and facility use, occupation, and return.
- Water quality, including surface water, groundwater, storm water, and wetlands.
- HM and HW disposal and potential cleanup requirements.
- Socioeconomic and political condition sensitivities and desired end states pertaining to or functions of environmental conditions.

## Protection Levels

2-41. The staff develops an OPORD, OPLAN, or CONPLAN. The staff may publish a full environmental annex/appendix only once. To facilitate changes in environmental requirements, the command may produce an environmental protection-level matrix similar to the example in Figure 2-6. This matrix ties directly into risk assessment, discussed later in this chapter and is applied in the MDMP during mission analysis (step 7).

Environmental Protection Level				
Level 1		Level 2	Level 3	Level 4
1. Waste Management				
a. Human waste	Unit SOP	Slit trench	Burnout latrine	Sanitary sewer
b. Solid waste	Unit SOP	Unit incineration or burial	Incineration	Landfill
c. Medical waste	Unit SOP	Field collection, consolidate disposal	US or host nation (HN) approved disposal methods	Same
d. Hazardous waste	Unit SOP	Field collection, battalion disposal	Unit collection point, classify, label, DLA contract	Resource Conservation and Recovery Act (RCRA) or HN procedures
2. Hazardous Materials				
	Unit SOP	Spill response, report any water contamination	HM tracking, spill response, report spills over 50 gallons	Spill prevention plans, response teams
3. Natural Resources				
a. Water	Unit SOP	Unit SOP	Erosion control	No degradation of water due to erosion or effluent
b. Vegetation	Unit SOP	Restriction on camouflage	Clearing in excess of 100 acres requires joint task force (JTF) approval	Clearing requires environmental assessment
c. Air	Unit SOP	Dust suppression nonhazardous only	Control open fires, fugitive dust	Controls on incineration and traffic
d. Wildlife	Unit SOP	Unit SOP	Note and avoid specific habitats	Taking of species prohibited
4. Cultural and Historical Resources				
	Unit SOP	Minimize damage if possible	Division-level approval required for operations in area	JTF approval required for operations in area

**Figure 2-6. Notional environmental protection matrix**

2-42. Standard levels of environmental protection facilitate planning, communications, and flexibility. The notional array of protection levels in Figure 2-6 ranges from Level 1 to Level 4. Level 1 is less restrictive and more appropriate for tactical units in combat. Level 4 is very restrictive and more appropriate for units in garrisons, fixed installations, on major training exercises, or while performing humanitarian missions in relatively secure and developed areas. Levels 2 and 3 are merely intermediate steps between the baseline and optimum levels. Foreign nations or regions in which US forces operate may have additional environmental protection requirements.

2-43. Staffs may use a matrix to designate protection requirements for specific missions or areas, to clearly identify and quickly notify units of changes, or to notify newly arriving units of the rules in the AO.

### **Environmental Baseline Survey (EBS)**

2-44. Many operations require fixed facilities, structures, or other real property as logistics, command and control, administration, communications, billeting, base camp, or other mission purposes. If the tactical situation permits, commanders conduct or direct an initial EBS before occupying the AO. An EBS is typically performed by or with support from, installations, corps, divisions, or higher HQs. However, brigades and even task forces may need to perform an initial EBS without much assistance from higher HQs. This situation would typically arise as a result of the initial reconnaissance of a proposed site. See Appendix B for additional EBS guidance and an example. See Chapter 5 for a discussion of base operations (BASOPS)-related information.

2-45. The initial EBS serves as a tool to assist in determining whether a parcel of land is acceptable for military use. The initial question should always be whether the site is healthy for soldiers and Marines. It documents the proposed site's existing environmental conditions and the likelihood of past or ongoing activities that may have created environmental, safety, or health problems. These problems include contamination of air, soil, groundwater, and surface water by toxic substances or POL.

2-46. Units conducting an initial EBS concern themselves with locating and documenting the presence or likely presence of any HM/HW or petroleum products on the property. An initial EBS will be focused on conditions indicating existing or past release, or possible release of toxic substances into structures, or the air, ground, groundwater, or surface water.

2-47. The person conducting the initial EBS will frequently be the unit's environmental officer, but the surveyor could be a member of a service's real estate team, preventive medicine personnel, a government or contract environmental engineer, quartering party personnel, or even a unit's reconnaissance element. Regardless, environmental knowledge and training will be key to the surveyor's success. He conducts and documents the initial EBS according to the tactical situation, mission, intended use of the facility, and time and personnel available.

2-48. EBS documentation becomes extremely important at the end of the mission or upon closure of a facility. See Figure 2-7. At that time, a closure EBS is done. The initial EBS and the closure EBS bracket the timeframe of use of the particular site/area.

An EBS should address the following areas:

- Property description and condition.
- Soil type and land cover.
- Water supply and source.
- Air quality.
- Signs of contamination.
- Presence of drums or containers.
- Biological and biomedical hazards (medical wastes).
- Lead-based paint.
- Unexploded ordnance.
- Other environmental and health hazards.
- Adjacent land use.
- Topographic, hydrologic, and geologic features.
- Sanitary waste disposal.
- Solid waste and HW presence.
- Presence of storage tanks.
- Heating and ventilation.
- Electrical-associated hazards.
- Fire-protection systems.
- Presence of asbestos-containing materials.
- Radiological hazards.

**Figure 2-7. Areas addressed in an EBS**

2-49. As soon as time and conditions permit, service real estate personnel may complete a more formal (or updated) EBS and site assessment. However, the initial assessment, conducted before occupation, is an important document that conducting units should safeguard. The surveying unit should retain a copy of the initial EBS and forward the original to higher HQs. The periodic use of environmental conditions reports (ECR) (see Appendix B) will assist the unit in both maintaining environmental standards and documenting their stay at a site/area. The electronic format report is also included in FM 101-5-2 and will prove helpful in writing the closure EBS.

## UNIT PLANNING

2-50. Staffs integrate environmental protection into planning for larger units. Unit leaders integrate environmental protection into unit planning for battalion- and company-level units. Unit planning includes:

- SOPs.
- OPORDs.
- Risk management plan (discussed later in this chapter).
- Training plans (see Chapter 3).

## **Standing Operating Procedures**

2-51. Unit leaders develop SOPs reflecting environmental protection considerations for routine tasks and activities. SOPs provide information to soldiers and Marines on how to accomplish routine tasks in an environmentally sound manner. SOPs incorporate local requirements. As local requirements change, unit leaders update their SOPs. SOPs also help define environmental protection requirements for all unit activities—facility operations, field operations, deployment, and combat. (See Appendix C for an example of a unit SOP.) Unit leaders ensure that SOPs comply with local requirements by coordinating with the higher headquarters' staff—usually the environmental office, the surgeon and his staff, preventive medicine personnel, and the SJA or ENCOORD.

2-52. Unit leaders conduct environmental risk assessments (see discussion later in this chapter and Appendixes F and G) when planning operations or activities. Risk assessment is a standard element of the MDMP. Unit leaders perform environmental risk assessments for activities not addressed in the SOP or when conditions differ significantly from those described in the SOP. A maintenance unit does not perform a risk assessment every time it performs a lubrication or service. Rather, the SOP describes the correct manner to perform these actions. Risk assessments apply to garrison operations as well as field operations.

## **Orders/Plans**

2-53. Unit leaders address environmental protection in their plans and orders including: WOs, OPORDs, OPLANs, CONPLANs, and fragmentary orders (FRAGOs). The higher headquarters' staff develops an environmental appendix/annex, to its OPORD/OPLAN/CONPLAN. Subordinate unit leaders draw environmental information from the environmental appendix (Appendix B of this manual) to the OPORD/OPLAN/CONPLAN, or from Annex L in a JOPEs document. FM 101-5 directs the inclusion of Appendix 2 (Environmental Considerations) to Annex F (Engineer) of the OPLAN/OPORD/CONPLAN and specifies that lower-level unit leaders/staffs include environmental information in the coordinating instructions and service and support paragraphs.

## **THE RISK MANAGEMENT PROCESS**

2-54. FM 101-5 describes risk management as the process of detecting, assessing, and controlling risk arising from operational factors and balancing risk with mission benefits. Risk management is an integral part of the MDMP. FM 100-14 outlines the risk management process and provides the framework for making risk management a routine part of planning, preparing, and executing operational missions and everyday tasks. Assessing environmental-related risks is part of the total risk management process.

2-55. Knowledge of environmental factors is key to planning and decision-making. With this knowledge, leaders quantify risks, detect problem areas, reduce risk of injury or death, reduce property damage, and ensure compliance



with environmental laws and regulations. Unit leaders should conduct risk assessments before conducting any training, operations, or logistical activities.

#### **TACTICAL RISK AND ACCIDENT RISK**

2-56. When assessing the risk of hazards in operations, the commander and staff must look at two types of risk:

- Tactical risk is risk concerned with hazards that exist because of the presence of either the enemy or an adversary, thus involving the considerations of force protection. It applies to all levels of war and across the spectrum of operations. For example, during the Gulf War, the enemy's demolition of oil fields created a significant health and environmental hazard to the surrounding countryside and to those units maneuvering through the area. (See Chapter 7.)
- Accident risk includes all operational risk considerations other than tactical risk. It includes risk to friendly forces and risk posed to civilians by an operation, as well as the impact of operations on the environment. It can include activities associated with hazards concerning friendly personnel, civilians, equipment readiness, and environmental conditions. Examples of environmental-related accident risk are improper disposal of HW, personnel that are not properly trained to clean up a spill, and units maneuvering in ecologically sensitive terrain. Preventive medicine considerations also fall into this area of risk.

2-57. Tactical risk and accident risk may be diametrically opposed. The commander may choose to accept a high level of environmental-related accident risk to reduce the overall tactical risk. For example, a commander may decide to destroy an enemy's petroleum storage area to reduce his overall tactical risk.

#### **LEGAL AND REGULATORY RESPONSIBILITIES**

2-58. Risk management does not convey authority to deliberately disobey local, state, national, or HN laws and regulations. It neither justifies ignoring regulatory restrictions and applicable standards nor bypassing risk controls required by law. Examples of risk controls include the provisions applicable to the transportation of HM and HW, life safety and fire protection codes, or the storage of classified material and physical security.

2-59. As described in AR 200-2 and MCO P5090.2A, the National Environmental Policy Act (NEPA) requires federal agencies, including the military, to consider the environmental consequences of their proposed actions before making decisions. The level of environmental consideration exercised depends on the scope of the action, the extent of public interest, and the potential for environmental impacts. NEPA requirements are discussed in Chapter 5 and Appendix A. Leaders should consult installation and operational staff on NEPA-related issues. NEPA concerns are generally installation or operational level unit considerations. For most unit-level (tactical) environmental decisions, leaders will conduct a risk assessment and identify environmental-related hazards as part of the process.

## **ENVIRONMENTAL BENEFITS OF RISK MANAGEMENT**

2-60. Risk management assists commanders in complying with environmental regulatory and legal requirements, and operating within the higher commander's intent. Risk management provides leaders a tool to do the following:

- Identify applicable environmental standards, laws, and rules of engagement (ROE) that effect the mission.
- Identify alternate COAs or alternate standards that meet the intent of the law and the operational requirements.
- Identify feasible and effective control measures where specific standards do not exist.
- Ensure better use of limited resources, such as training areas and ranges.
- Ensure the health and welfare of soldiers/Marines and other effected personnel. (See Chapter 7).
- Minimize or eliminate damage to natural and cultural resources.

## **RISK MANAGEMENT PRINCIPLES**

2-61. To guide environmental risk decision-making, commanders use the three risk management principles, described in FM 100-14:

- Integrate risk management into mission planning, preparation, and execution.
- Make risk decisions at the appropriate level in the chain of command.
- Accept no unnecessary risk.

## **THE FIVE STEP PROCESS**

2-62. FM 100-14 describes the five risk management steps. Leaders may use the document worksheets found in Appendix F to assist them in tracking these steps. Figure 2-8, page 2-18, shows the relationship of environmental hazards to the total risk management process.

2-63. The following steps identify specific environmental considerations that the commander and his staff must consider:

- Step 1. Identify (environmental) hazards.
- Step 2. Assess (environmental) hazards to determine risk.
- Step 3. Develop controls and make risk decisions.

- Step 4. Implement controls.
- Step 5. Supervise and evaluate.

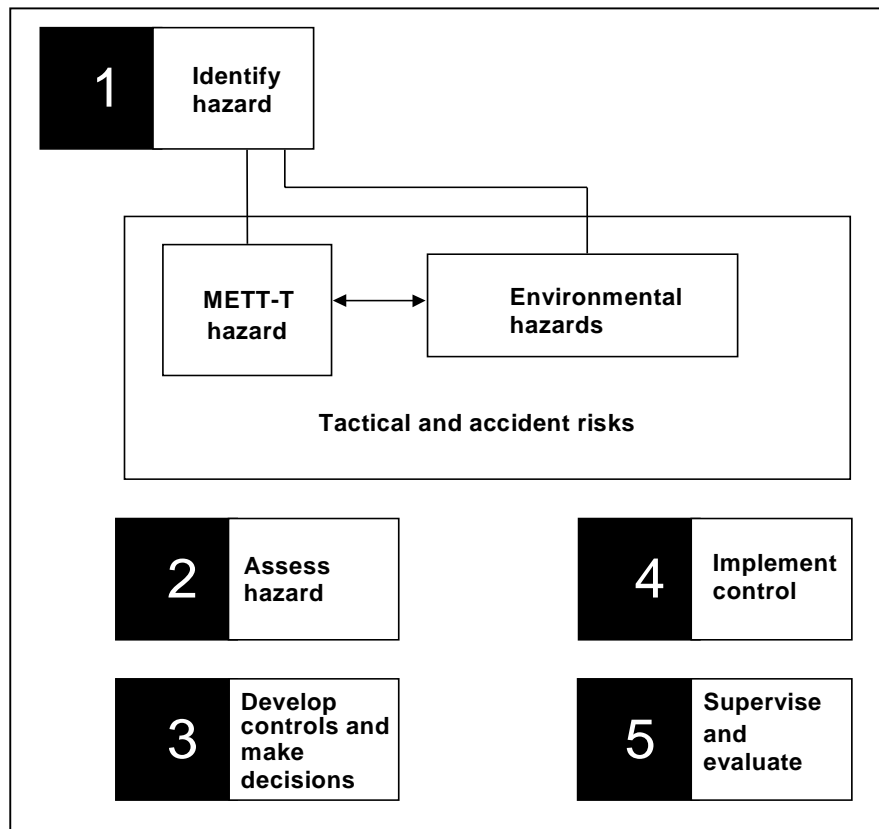


Figure 2-8. Environmental hazard relationship to the risk management process

### Identify (Environmental) Hazards

2-64. Commanders and staffs identify environmental hazards during mission analysis. FM 100-14 defines hazards as any actual or potential condition that can cause injury, or illness to, or the death of personnel; damage to or loss of equipment or property; or mission degradation. Environmental hazards include all activities that may pollute, create negative noise-related effects, degrade archaeological/cultural resources, or negatively affect threatened or endangered species' habitats. They also include environmental health-related hazards as further defined in Chapter 7. Figure 2-9, page 2-19 provides common environmental hazards identified by environmental media areas.

### Assess (Environmental) Hazards to Determine Risk

2-65. Risk assessment is a three-stage process to determine the risk of potential harm to the environment:

- Stage 1. Assess the probability of each hazard.

- Stage 2. Assess the severity of each hazard.
- Stage 3. Determine the risk level of each hazard.

2-66. Assessments include two factors: probability and severity. Probability is how often a hazard (environmental) is likely to occur. Severity is the effect a hazard will have expressed in terms of the degree of injury or illness, loss of or damage to equipment or property, environmental damage, and other mission-impairing factors, such as loss of combat power.

2-67. Probability and severity are estimates that require individual judgment and a working knowledge of the risk management process and its terminology. Figure 2-10, page 2-21, defines the four degrees of severity, and Figure 2-11, pages 2-21 to 2-22, the five degrees of probability for a hazard. Refer to Chapter 2 of FM 100-14 for a more in-depth discussion of these substeps as they relate to assessing environmental hazards to determine risk.

2-68. Leaders must assess the probability and the potential severity of environmental damage. Commanders use common sense, past evaluations, higher commander guidance, historical data, lessons learned, and any other useful sources to determine the probability of an event occurring. Severity, however, attempts to quantify the amount of potential damage created by an event. For example, the probability of a fuel spill occurring during an exercise might be remote. However, if the spill occurs in a body of water where the fuel will spread quickly, the potential severity could be catastrophic. In this example, the unit commander may choose to limit the potential severity by locating the fuels away from the body of water. While leaders must assess the probability of environmental damage, they must also determine how much damage the event would cause, regardless of the probability.

Media Area	Common Environmental Hazards
Air	Equipment exhaust Convoy dust Range fires Open air burning Pyrotechnics/smoke pots/smoke grenades Part-washer emissions Paint emissions (to include CARC considerations) Air conditioner/refrigeration chlorofluorocarbons (CFCs) HM/HW release Pesticides Other toxic industrial chemicals/material
Archaeological/cultural	Maneuvering in sensitive areas Digging in sensitive areas Disturbing or removing artifacts Demolition/munitions effects HM/HW spills Sonic booms/prop wash

**Figure 2-9. Common environmental hazards**

Noise	Low flying aircraft (helicopters) Demolition/munitions effects Night operations Operations near post/camp boundaries and civilian populace Vehicle convoys/maneuvers Large scale exercises
Threatened/ endangered species	Maneuvering in sensitive areas Demolition/munitions effects, especially during breeding seasons Disturbing habitat or individual species HM/HW spills or releases Poor field sanitation Improper cutting of vegetation Damage to coral reefs
Soil (terrain)	Over-use of maneuver areas Demolition/munitions effects Munitions and munitions related wastes Range fires Poor field sanitation Poor maneuver-damage control Erosion Troop construction effects Refueling operations HM/HW spills Maneuver in ecologically sensitive areas such as wetlands and tundra Industrial waste runoff Pesticide accumulation in soil, vegetation, and terrestrial organisms
Water	Refueling operations near water sources HM/HW spills Erosion and unchecked drainage Amphibious/water crossing operations Troop construction effects Poor field sanitation Washing vehicles at unapproved sites

**Figure 2-9. Common environmental hazards (continued)**

2-69. It is usually easier to determine probability than severity. Definitions for the degrees of severity are not absolutes; they are more conditional and related to mission, enemy, terrain, troops, time available, and civilian considerations (METT-TC). Leaders must use their experience, judgment, lessons learned, and subject matter experts to assist them in determining degrees of severity. The following examples of severity for archaeological, historical, or cultural sites provide leaders a frame of reference for what may be included when estimating degrees of severity.

- **Catastrophic** - irreparable damage, total loss of the site, complete destruction, irreplaceable, and anticipate widespread public concern. Will require notification of higher HQs, public affairs, and outside agencies.
- **Critical** - major physical damage to historical/cultural structure. Restoration is difficult, long-term, costly, and will require assistance and notification of higher HQs, public affairs, and outside agencies.

- **Marginal** - minor physical damage to historical/cultural structures which can be restored with outside assistance. Unit must report damage to higher HQs.
- **Negligible** - surrounding site damage from individual and vehicular activities easily repaired or restored by the unit; no physical damage to structures; unit must report damage to higher HQs.

Severity Rating	Definition
<b>Catastrophic (I)</b>	Loss of ability to accomplish the mission or near mission failure, death or permanent total disability (accident risk), loss of major or mission-critical system or equipment, major property (facility) damage, severe (strategic) environmental damage, mission-critical security failure, unacceptable collateral damage
<b>Critical (II)</b>	Significantly (severely) degraded mission capability or unit readiness, permanent partial disability, temporary total disability exceeding 3 months time (accident risk), extensive (major) damage to equipment or systems, significant damage to property or the environment, security failure, significant collateral damage
<b>Marginal (III)</b>	Degraded mission capability or unit readiness, minor damage to equipment or systems, property, or the environment; lost days due to injury or illness not exceeding 3 months (accident risk); minor damage to property or the environment
<b>Negligible (IV)</b>	Little or no adverse impact on mission capability, first aid or minor medical treatment (accident risk), slight equipment or system damage but fully functional and serviceable, little or no property or environmental damage

Figure 2-10. Hazard severity

Frequent (A) occurs very often, continuously experienced	
Single item	Occurs very often in service life, expected to occur several times over duration of a specific mission or operation, always occurs
Fleet or inventory of items	Occurs continuously during a specific mission or operation or over a service life
Individual soldier	Occurs very often in career, expected to occur several times during mission or operation, always occurs
All soldiers exposed	Occurs continuously during a specific mission or operation
Likely (B) occurs several times	
Single item	Occurs several times in service life, expected to occur during a specific mission or operation
Fleet or inventory of items	Occurs at a high rate, but experienced intermittently (regular intervals, generally often)
Individual soldier	Occurs several times in career, expected to occur during a specific mission or operation
All soldiers exposed	Occurs at a high rate, but experienced intermittently

**Figure 2-11. Hazard probability**

<b>Occasional (C) occurs sporadically</b>	
Single item	Occurs some time in service life, may occur about as often not during a specific mission or operation
Fleet or inventory of items	Occurs several times in service life
Individual soldier	Occurs some time in career, may occur during a specific mission or operation, but not often
All soldiers exposed	Occurs sporadically (irregularly, sparsely, or sometimes)
<b>Seldom (D) remotely possible; could occur at sometime</b>	
Single item	Occurs in service life but only remotely possible, not expected to occur during a specific mission or operation
Fleet or inventory of items	Occurs as isolated incidents, possible to occur some time in service life but rarely, usually does not occur
Individual soldier	Occurs as isolated incident during a career, remotely possible, but not expected to occur during a specific mission or operation
All soldiers exposed	Occurs rarely within exposed population as isolated incidents
<b>Unlikely (E) can assume will not occur, but not impossible</b>	
Single item	Occurrence not impossible, but may assume will almost never occur in service life, may assume will not occur during a specific mission or operation
Fleet or inventory of items	Occurs very rarely (almost never or improbable), incidents may occur over service life
Individual soldier	Occurrence not impossible, but may assume will not occur in career or during a specific mission or operation
All soldiers exposed	Occurs very rarely, but not impossible

**Figure 2-11. Hazard probability (continued)**

2-70. Using the defined degrees of probability and severity, an individual can determine the overall environmental-related risk level from the intersection of the two in the risk assessment matrix shown in Figure 2-12.

<b>Risk Assessment Matrix</b>					
<b>SEVERITY</b>	<b>Probability</b>				
	Frequent (A)	Likely (B)	Occasional (C)	Seldom (D)	Unlikely (E)
<b>Catastrophic (I)</b>	E	E	H	H	M
<b>Critical (II)</b>	E	H	H	M	L
<b>Marginal (III)</b>	H	M	M	L	L
<b>Negligible (IV)</b>	M	L	L	L	L

**Figure 2-12. Risk assessment matrix**



<b>Risk Category</b>
<b>Extremely High (E)</b> Mission failure if hazardous incidents occur during mission. A frequent or likely probability of catastrophic loss (IA or IB) or frequent probability of critical loss (IIA) occurs.
<b>High (H)</b> Significantly degraded mission capabilities in terms of required mission standard or not accomplishing all parts of the mission, not completing the mission to standard (if hazards occur during mission). Occasional to seldom probability of catastrophic loss (IC or ID). A likely to occasional probability of a critical loss occurring (IIB or IIC) with material and soldier system. Frequent probability of marginal (IIIA) losses.
<b>Moderate (M)</b> Expected degraded mission capabilities in terms of required mission standard. Will have reduced mission capability (if hazards occur during mission). Unlikely probability of catastrophic loss (IE). The probability of a critical loss occurring is seldom (IID). Marginal losses occur with a probability of no more often than likely (IIIB or IIIC). Frequent probability of negligible (IVA) losses.
<b>Low (L)</b> Expected losses have little or no impact on accomplishing the mission. The probability of critical loss is unlikely (IIE), while that of marginal loss is no more often than seldom (IIIB through IIIE).

**Figure 2-12. Risk assessment matrix (continued)**

2-71. A practical example of assessing environmental-related risk is provided in Appendix G.

### **Develop Controls and Make a Decision**

2-72. Develop controls to eliminate or reduce the probability or severity of each hazard, to lower the overall risk. Controls include of one of the following categories:

- Educational.
- Physical.
- Avoidance.

2-73. Figure 2-13, page 2-24, provides environmental-related control examples. The checklist in Appendix E provides additional means for addressing and reducing environmental risk through the use of effective controls.

Control Type	Environmental-Related Examples
Educational	<ul style="list-style-type: none"> <li>• Conducting unit environmental awareness training</li> <li>• Conducting an environmental briefing before deployment</li> <li>• Performing tasks to environmental standards</li> <li>• Reviewing environmental considerations in AARs</li> <li>• Reading unit's environmental SOPs and policies</li> <li>• Conducting spill prevention training</li> <li>• Publishing an environmental annex/appendix to the OPORD/OPLAN</li> </ul>
Physical	<ul style="list-style-type: none"> <li>• Providing spill prevention equipment</li> <li>• Establishing field trash collection point and procedures</li> <li>• Establishing field satellite accumulation site and procedures</li> <li>• Policing field locations</li> <li>• Practicing good field sanitation</li> <li>• Filling in fighting positions</li> <li>• Posting signs and warnings for off-limit areas</li> </ul>
Avoidance	<ul style="list-style-type: none"> <li>• Maneuvering around historical/cultural sites</li> <li>• Establishing refueling and maintenance areas away from wetlands and drainage areas</li> <li>• Crossing streams at approved sites</li> <li>• Preventing pollution</li> <li>• Limiting noise in endangered and threatened species habitats</li> <li>• Avoiding refueling over water sources</li> <li>• Curtailing live vegetation use for camouflage</li> </ul>

**Figure 2-13. Environmental-related controls**

2-74. Many environmental risk controls are simply extensions of good management, housekeeping, operations security (OPSEC), and leadership practices. Risk reduction controls include conducting rehearsals, changing locations, establishing procedures, and increasing supervision.

2-75. Once all feasible risk control measures are in place, some risk will always remain. This residual risk requires leaders' attention. Unit leaders inform their chain of command of the residual risk and its implications on the operation. Unit leaders also inform their subordinates and focus C<sup>2</sup> efforts on those portions of the operation. The commander alone decides whether or not to accept the level of risk. He may also direct his staff to consider additional controls or a change in the COA based on environmental risk.

### Implement Controls

2-76. Inform subordinates, down to individual soldiers/Marines, of risk control measures. State how each control will be implemented, and assign responsibility. For example, if the control measures for a fuel spill hazard are to ensure that operators are properly trained to dispense fuel and appropriate spill equipment is available, then leaders must ensure that these controls are in

place before the operation begins. This preparation requires leaders to anticipate environmental requirements and incorporate them into long-, short-, and near-term planning as described in Chapter 3. The key to success is identifying the “who, what, where, when, and how” aspects of each control.

### **Supervise and Evaluate**

2-77. Leaders and staffs continuously monitor controls throughout the operation to ensure their effectiveness and to modify controls as required. They also make on-the-spot corrections, evaluate individual and collective performance, hold those in charge accountable, and require that all tasks be performed to applicable environmental standards. Leaders ensure that the AAR process includes an evaluation of environmental-related hazards, controls, soldier/Marine performance, and leader supervision. Finally they ensure the development of environmental lessons learned for use in future operations.

### **SUMMARY**

2-78. It is essential to include environmental considerations early and throughout the planning cycle. The integration of environmental considerations is an easy fit and causes no functional change in the MDMP process. Like safety, it is another consideration to apply during these processes. Many leaders and soldiers/Marines have already been performing in a manner that takes environmental considerations into account. Leaders may build on this existing environmental awareness as they responsibly integrate environmental considerations into all military planning, training, and operations. Chapter 6 and Appendix E describe how to both establish and assess an environmental program.

2-79. Unit leaders use risk assessment to estimate the impact of their unit activities on the natural environment and to identify environmentally-related safety issues for their soldiers or Marines. Environmental-related risk is part of the risk management process as detailed in FM 100-14. Knowledge of environmental factors is key to planning and decision-making. Risk management does not convey authority to deliberately disobey local, state, national, HN laws and regulations, or the environmental laws of war (ELOW). Risk management assists commanders in complying with environmental regulatory and legal requirements, and operating within the higher commanders' intent. Unit leaders should complete risk assessments before conducting training, operations, or logistical activities. Risk assessments assist leaders and their staffs in identifying potential environmental hazards, develop controls, make risk decisions, implement those controls, and ensure proper supervision and evaluation. Unit staffs consolidate environmental risks, as well as all other risk, into the overall unit risk management plan for an operation.